Glow-worm

The energy you need

Installation manual

Envirosorb$_3$ 8

Envirosorb$_3$ 11

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1 Safety

1.1 Symbols used

The warning notes are classified in accordance with the severity of the possible danger using the following warning signs and signal words.

Warning symbol	Explanation
	Danger! Immediate danger to life or risk of severe personal injury.
	Danger! Risk of death from electric shock.
	Warning! Risk of minor personal injury.
	Caution! Risk of material or environmental damage.

1.2 Qualifications

Any work carried out must be by suitably qualified personnel.

- Incorrect installation can cause damage to the unit, to the site or injury to others.

1.3 General safety advices

- Before to read this chapter, also read the general safety advices of the operating instructions.

1.3.1 Danger to life by electric shock

Touching live connections can cause serious personal injury.

- Before carrying out any work on the product, switch off the power supply.
- Secure the power supply against being switched on again.

1.3.2 Danger to life due to missing or not properly working safety devices

Missing safety devices can cause life-threatening scalding and other injuries, for example by burst pipes.

The information contained in this document do not show all schemes required for a professional installation of safety devices.

- Install the necessary safety devices in the system.
- Inform the user about the function and location of safety devices.
- Observe the relevant national and international laws, standards and guidelines.

1.3.3 Danger due to improper use

Nonprofessional work on the product can cause damage to the installation and as a consequence even personal injury.

- Only work on the product if you are a competent person.

1.3.4 Risk of material damage by additives in the heating water

Frost and corrosion protection agents can cause changes to seals, noise during heating mode and may lead to other consequential damage.

- Do not use any unsuitable frost or corrosion protection agents.

1.3.5 Risk of material damage caused by unsuitable tools

The use of unsuitable tools or improper use thereof may cause damage, such as gas or water leaks.

- When tightening or loosening threaded connections, always use suitable opened spanners, but do not use pipe wrenches, extensions, etc.

1.3.6 Risk of structural damages by escaping water

Incorrect installation can cause leakages.

- Make sure there are no stresses in the hydraulic lines.
- Correctly position the seals.

1.4 R410A Refrigerant

Danger!
Risk of injury due to incorrect work on the refrigerant circuit!
The appliance contains refrigerant fluid and must be handled with caution. Any work on the refrigerant circuit must be performed by trained and approved personnel.

- Only work on the refrigerant circuit if you are a trained and approved specialist equipped with appropriate protective equipment.
- Perform draining and filling operations in a properly ventilated area.
- Avoid any contact with the skin or eyes.

R410A fluorinated greenhouse gases are contained within a fully sealed system (Kyoto Protocol PES 1975). Under normal use and conditions, the refrigerant is not dangerous. Degassing refrigerant fluid into the atmosphere is prohibited, except when necessary to ensure personal safety.

The refrigerant fluid contains gases that, when released into the atmosphere, may affect the environment, contributing to the greenhouse effect and an increase in temperature. The risk of leakage cannot be excluded for devices intended to operate for many years and subject to the effects of the environment.

- Use only R410A refrigerant.
- The tools used for charging, for measuring pressure, for creating a vacuum and for the recovery of the fluid must be compatible with and employed solely for R410A.

- Welding is to be carried out with nitrogen and the circuit's air-tightness is to be tested under pressure, with nitrogen.
- Refilling must be done at the liquid phase.
- In case of leakage, do not add fluid: drain the remaining fluid from the circuit and eliminate, in accordance with the applicable regulations.
- Create a vacuum in the circuit with a maximum pressure of 10 mbar (10 x 10^2 Pa) (static pressure).
- Bleed the circuit before any welding work.
- Comply with the values given in chapter 10 when charging with refrigerant.

1.5 Intended use

The product is a state-of-the-art product which has been constructed in accordance with recognised safety regulations. Nevertheless, there is still a risk of injury or death to the user or others or of damage to the product and other property in the event of improper use or use for which it is not intended.

The heat pump is a air -water system which heats all types of buildings by using the energy contained in the outside air.

The system enhances the recuperated energy so that it can be utilized by traditional heating (heating floor and/or low-temperature radiators).

The heat pump cannot be used without its control box Systempro.

Intended use includes the following:

- observing the included operating, installation and maintenance instructions for this product and any other parts and components of the system
- installing and fitting the product in accordance with the product and system approval
- complying with all of the inspection and maintenance conditions listed in the instructions.

Any other use than the use described in the instructions at hand or any use extending the described use is not intended.

Any direct commercial or industrial use is also deemed to be improper.

Any unintended use is prohibited.

1.6 Rules and regulations

On installing and commissioning the appliance you must adhere to the technical rules, standards and provisions in effect at the time.

1.7 CE label

The CE mark indicates that the products described in these instructions are in compliance with the following directives:

- Directive 2006/95/EC of the Council with amendments "Directive Concerning Electrical Equipment for Use Within Specific Voltage Limits" (Low voltage directive)
- Directive 2004/108/EC of the Council with amendments "Directive Concerning Electromagnetic Compatibility"
- Directive 97/23/EEC of the Council with amendments "Directive Concerning pressure equipment"
- Directive 2007/1494/EC of the Council with amendments, dated December 17, 2007, determining, in accordance with Directive 2006/842/EC of the Council with amendments, the label type and the additional requirements as regards the labelling of products and equipment containing certain fluorinated greenhouse effect gas.
- Directive 2006/842/EC of the Council with amendments of May 17, 2006 on certain fluorinated greenhouse gasses (OJEU of June 14, 2006)

1.8 Approvals

This product has been fully tested in accordance with:

- BS EN 14511:2011

1.8.1 Local regulations

Benchmark places responsibilities on both manufacturers and installers. The purpose is to ensure that customers are provided with the correct equipment for their needs, that it is installed, commissioned and serviced in accordance with the manufacturer's instructions by a competent person approved at the time by the Health and Safety Executive and that it meets the requirements of the appropriate Building Regulations.
The Benchmark Checklist can be used to demonstrate compliance with Building Regulations and should be provided to the customer for future reference.

Installers are required to carry out installation, commissioning and servicing work in accordance with the Benchmark Code of Practice which is available from the Heating and Hotwater Industry Council who manage and promote the Scheme.

- Visit www.centralheating.co.uk for more information.

benchmark
COLLECTIVE MARK
THE MARK OF QUALITY FOR THE INSTALLATION, COMMISSIONING AND SERVICING OF DOMESTIC HEATING AND HOT WATER SYSTEMS

1.9 Regulations

1.9.1 Statutory requirements

IMPORTANT

Where no British Standards exists, materials and equipment should be fit for their purpose and of suitable quality and workmanship.

The installation of this appliance must be carried out by a competent person in accordance the rules in force in the countries of destination.

Manufacturer's instructions must not be taken as overriding statutory requirements.

Standards

On installing and commissioning the appliance you must adhere to the technical rules, standards and provisions in effect at the time.

Reminder of existing regulatory acts

- EC regulation No. 20372000 from the 29th of June 2000 This European regulation repeals regulation No. 3093/94 and presents the elimination schedules of CFC and HCFC. It also deals with the collection of refrigerants, system leaks, particularly systems containing more than 3 kg of CFC or HCFC, as well as the minimum level of qualification required by the technicians.

- EC regulation No. 0842/2006 from the 17th of May 2006 regarding the containment, use, collection and disposal of the fluorinated greenhouse gases, the labelling and elimination of the products and equipment containing these gases, the restriction of use and banning of certain products from the market, as well as the training and certification of personnel and companies operating in the activities targeted by this regulation: refrigeration, air-conditioning, heat pumps and fire protection systems containing greenhouse gases.

1.9.2 Other regulations

Control of Substances Hazardous to Health

Under Section 6 of The Health and Safety at Work Act 1974, we are required to provide information on substances hazardous to health. The adhesives and sealants used in this appliance are cured and give no known hazard in this state.

The refrigerant used in this appliance is R410a the use of which is strictly controlled by F Gas regulation EN842/2006.

2 Notes on the documentation

- These instructions consist of, Installation, Servicing, Fault Finding and Replacement of Parts. The instructions are an integral part of the appliance and must be handed to the user on completion of the installation.

2.1 Observe other applicable documents

- Observe absolutely all operating and installation instructions enclosed with the product, for the various parts and components of the system.

2.2 Storing documents

- Pass these instructions and all other applicable documents to the system user.

The system user should retain these instructions so that they are available when required.

2.3 Validity of the instructions

These instructions apply exclusively to:

Type overview		
Product	Type designation	Article number
Envirosorb3	8	0010011967
Envirosorb3	11	0010011968

For all system schematics and information please refer to the heatpump system manual.

3 Appliance description

3.1 Safety devices

- The appliance is designed to operate with an outside temperature between -20°C and 35°C in heating mode and between -20°C and 46°C for tank heating.
- A high pressure switch limits the operation of the appliance when the refrigerant fluid pressure exceeds 41.5 bar (gauge pressure) (41.5 x 10^5 Pa) (relative pressure).
- When the appliance is shut down, the compressor crankcase heater is activated below 7°C at the compressor outlet to prevent any damage when restarting.
- If the compressor outlet temperature is below 1°C, the appliance will not allow the compressor to start.
- A temperature sensor at the compressor outlet limits the operation of the heat pump when the temperature measured by this sensor is higher than the maximum limit. This value varies depending on the evaporation and condensation temperatures.
- The appliance is equipped with a measuring device that checks the water flow rate at start-up.
- An anti-freezing protection device runs the heat pump hydraulic pump when the hydraulic circuit temperature is lower than 3°C. However, it is necessary to add anti-freeze to the heat pump hydraulic circuit. Without the addition of outside energy or in the case of a power cut, the circuit water can drop below the freezing point.

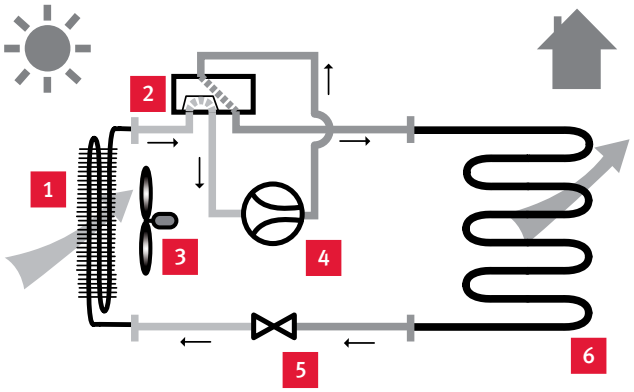
3.2 Concept of operation

A heat pump (HP) is a thermodynamic machine which transfers heat from one location to another. To do so, it employs the characteristics of a refrigerant fluid.

The system is composed of the following circuits:

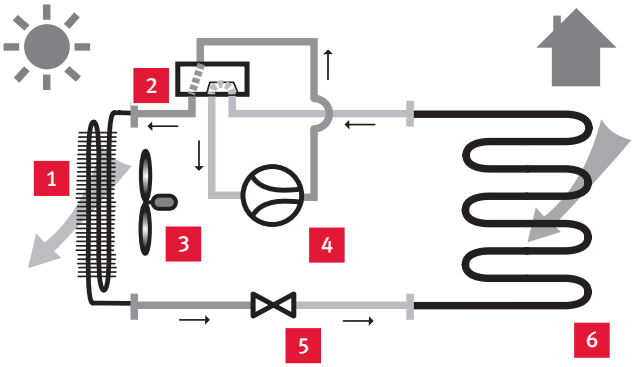
- The refrigerant circuit which transfers heat to the water circuit following the evaporation, compression, condensation and expansion of the fluid.
- The heating circuit.

3.2.1 Heating mode



Key
1 Fin exchanger
2 Four way valve
3 Ventilating fan
4 Compressor
5 Expansion valve
6 Plate to plate heat exchanger

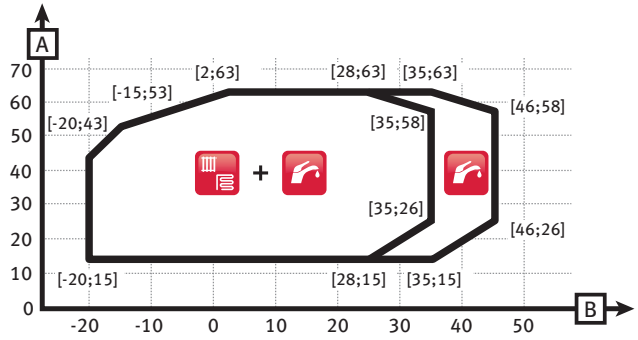
3.2.2 Defrosting mode



Key
1 Fin exchanger
2 Four way valve
3 Ventilating fan
4 Compressor

5 Expansion valve
6 Plate to plate heat exchanger

3.2.3 Operating limits in heating mode

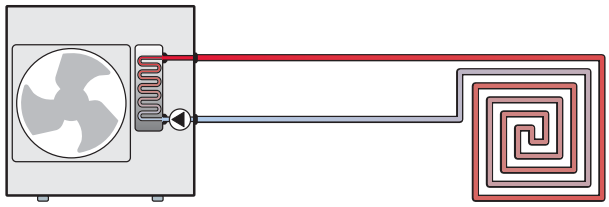


Key

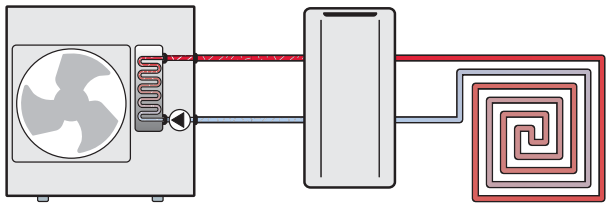
Heating operating limits
Domestic hot water operating limits
A Water temperature
B Air temperature

3.2.4 Permitted hydraulic configurations

3.2.4.1 Direct connection to the installation heating circuit



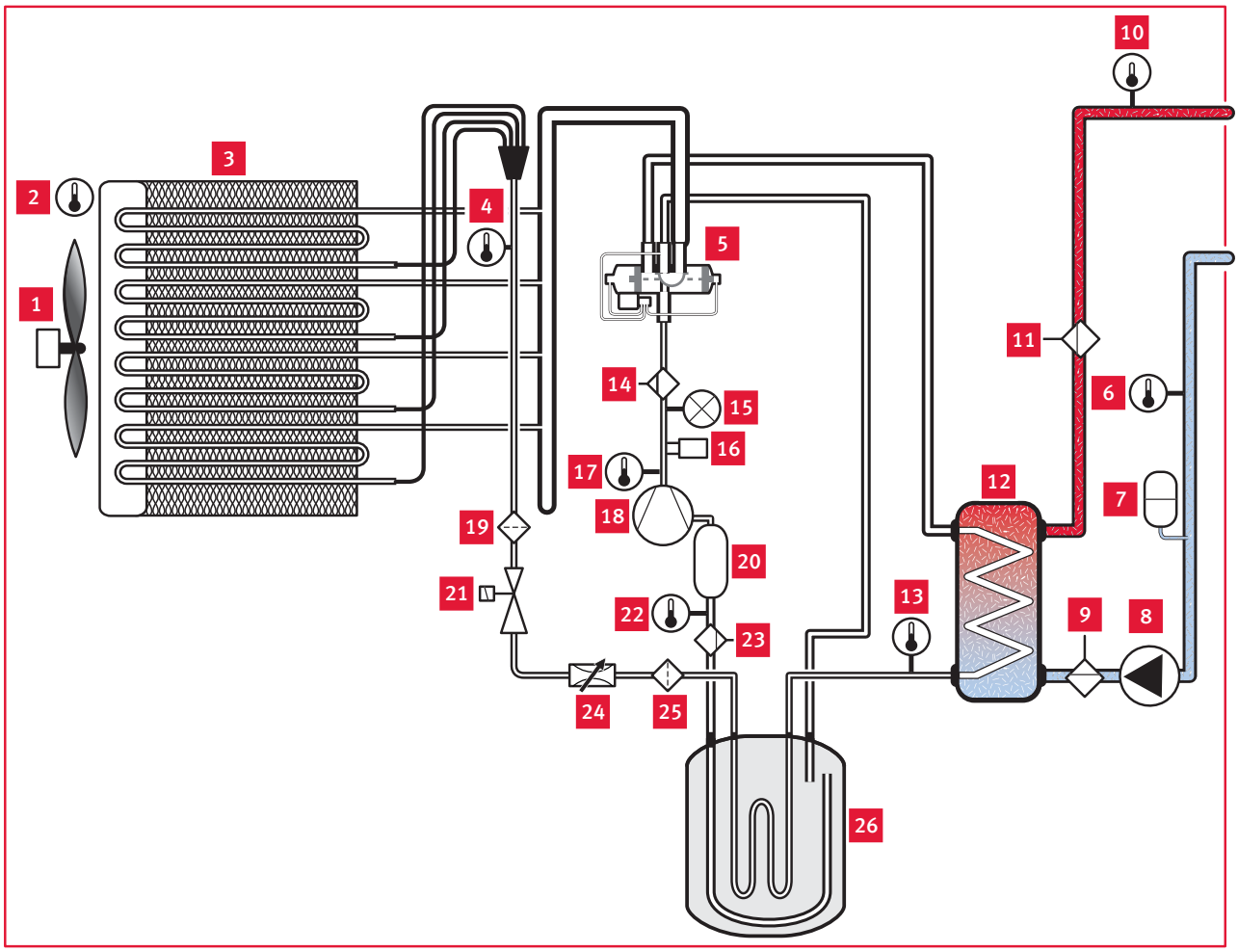
3.2.4.2 Indirect connection with a hydraulic module



For detailed configurations please refer to the system manual.

3.3 Structure of the appliance

3.3.4.1 Hydraulic and refrigerant schematic



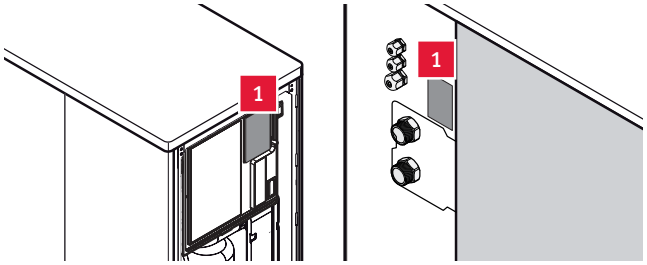
Key

1 Ventilating fan
2 Outside air temperature sensor
3 Finned heat exchanger
4 Finned heat exchanger temperature sensor
5 4-way valve
6 Heat pump return circuit temperature sensor
7 Expansion vessel
8 Modulating high performance pump including a water flow rate sensor
9 Water bleed
10 Heat pump flow temperature sensor
11 Draining valve for the heat pump circuit
12 Plate to plate heat exchanger
13 Temperature sensor after plate to plate heat exchanger
14 High-pressure circuit maintenance valve
15 Refrigerant pressure switch
16 Refrigerant circuit high pressure sensor
17 Compressor discharge temperature sensor
18 Rotary compressor
19 Filter
20 Anti-slugging bottle
21 Electronic expansion valve
22 Compressor suction temperature sensor
23 Low-pressure circuit maintenance valve
24 Flow rate limiter in cooling mode
25 Filter
26 Gas buffer

A Heat pump return
B Heat pump flow

3.4 Type designation and serial number

Data plate location:



Key
1 Data plate

The type designation and the serial number are shown on the data plate.

3.5 Data plate description

The data plate contains the following data:

Abreviation/ symbol	Description
Serial-no	Commercial name and serial number
IP	The electrical protection class
V/Hz	The pump + compressor + regulatory devices supply voltage
I max	The maximum current
R410A	The type of refrigerant fluid, the amount necessary for filling
PS_R	The max. working pressure of the cooling circuit
PS_H min PS_H max	Minimum and maximum hydraulic pressure
COP (Ax/Wxx)	The coefficient of performance (COP) for an air temperature of xx°C and heating flow temperature of xx°C
(Ax/Wxx)	The heating power for an air temperature of xx°C and heating flow temperature of xx°C
EER (Axx/Wx)	The Energy Efficiency Ratio (EER) for an air temperature of xx°C and cooling flow temperature of xx°C
(Axx/Wx)	The refrigerating power for an air temperature of xx°C and cooling flow temperature of xx°C
CE	See chapter "CE label"

4 Mounting and installation

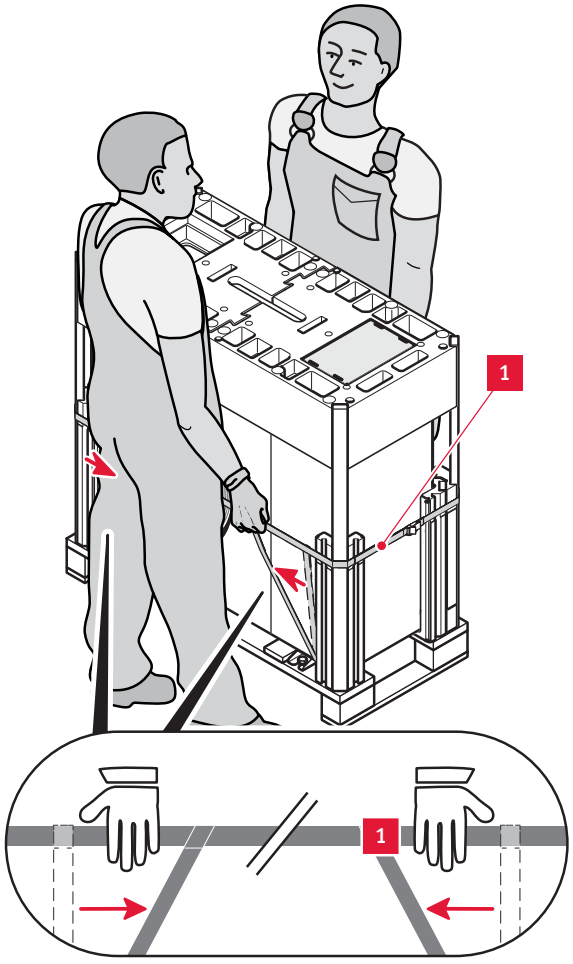
4.1 Preparing mounting and installation

4.1.1 Delivery, transport and installation on site

4.1.1.1 Transport

Warning!
Risk of injuries due to big carrying loads.
Too big carrying loads can cause injuries, e.g. on the backbone.
- Observe all relevant laws and other prescriptions when carrying heavy products.
- Refer to chapter 10 for the weight of the appliance.
- Plan two people at minimum to move the appliance.

Caution!
Risk of equipment damage due to appliance transport.
If the appliance is tilted more than 45° during transport, the refrigerant circuit can be damaged which may result in complete failure of the installation.
- Do not tilt the appliance more than 45° during transport.



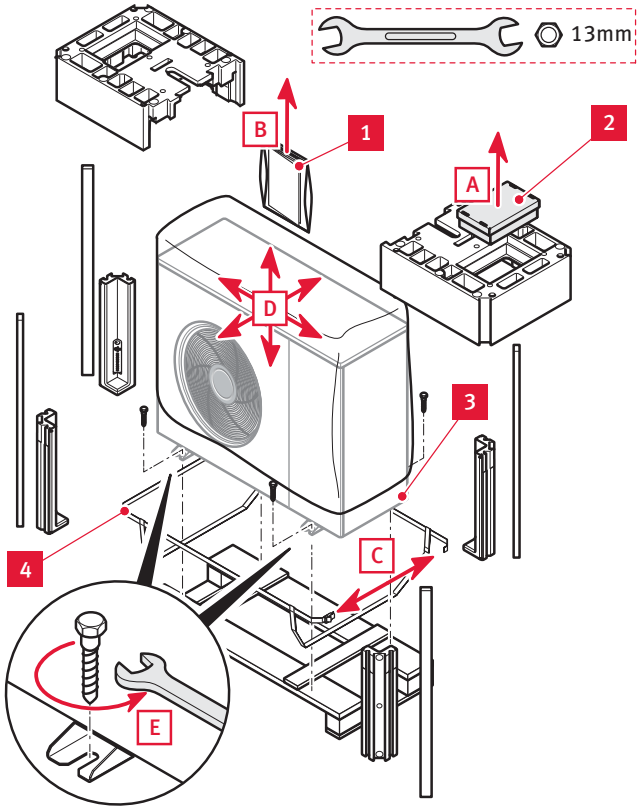
Key
1 Transport strap

- Use the transport strap (1) to move the appliance.

Installation pipework must be designed and installed to ensure venting of air from the system is possible.

- Only lift the appliance from the rear and the side containing the hydraulic connectors.
- Attach the appliance to the two-wheeled trolley with a strap.
- Protect surfaces in contact with the trolley to avoid scratching or damaging the appliance.
- Use a sufficiently solid ramp to lower the appliance from the pallet.

4.1.1.2 Unwrapping



Key
1 Bag of documents
2 Accessory box
3 Heat Pump
4 Transport strap

- Remove the screws from the transport pallet at the front and rear of the unit (E).
- Remove the bag of documents (B) and the accessory box (A).
- Detach the transport strap (C).
- Carefully remove the packaging and protections without damaging the parts of the appliance (D).

4.1.1.3 Checking the equipment delivered

- Check the contents of the packages.

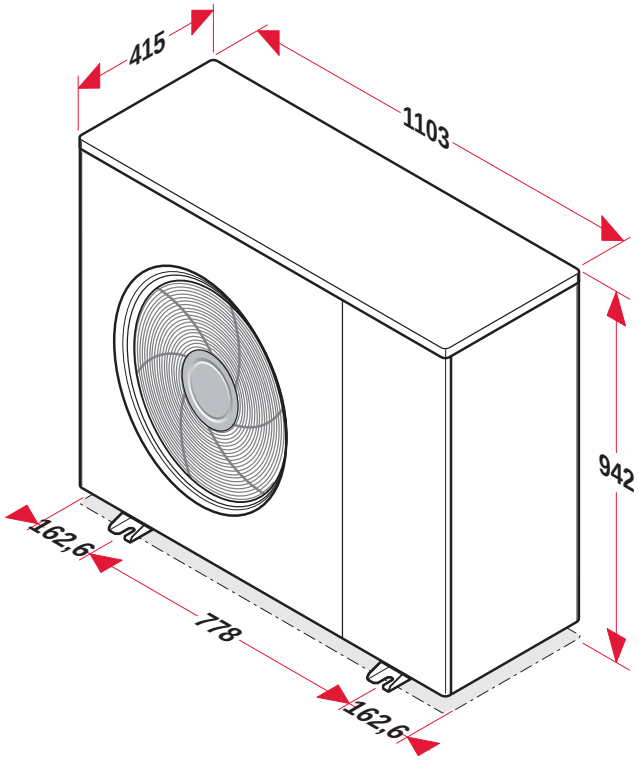
The appliance is delivered with a bag of documents and a box of accessories which contains the following items:

- 1 condensate drain assembly (adaptor + elbow + clip)
- 1 bag of seals
- 4 anti-vibration blocks
- 1 bleeding tube

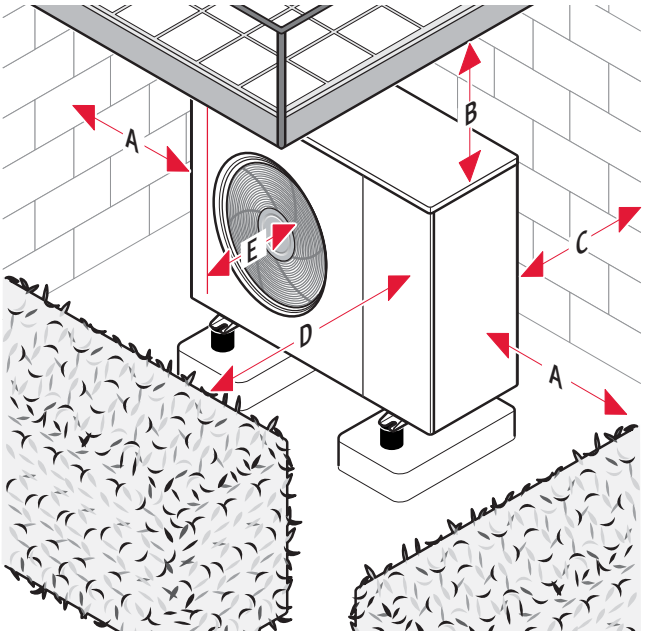
4.1.2 Observing distances and mounting clearances

All the drawings dimensions are shown in mm.

4.1.2.1 Product dimensions



4.1.2.2 Accessibility



Distance	In heating mode only
A	› 250 mm
B	› 1000 mm
C	› 120 mm
D	› 600 mm
E	› 300 mm

- Comply with the distances above to obtain the correct air flow and facilitate maintenance operations.
- Make sure that the available space is sufficient for the installation of the water system piping.
- If the heat pump is installed in an area subject to heavy snow fall, ensure that snow does not build up around the appliance to maintain the distances given above. Otherwise, install a backup heat generator in the building's heating system.

4.1.3 Appliance location

- Observe current regulations.
- Install the appliance outside.
- Do not install the appliance:

- near a heat source,
- near flammable materials,
- near the ventilation points of adjacent buildings
- beneath deciduous trees.

- Take into account the following when installing the heat pump:

- prevailing winds,
- the noise generated by the fan and the compressor
- the visual impact on the surrounding neighbourhood.

- Avoid areas exposed to strong winds directed against the appliance's air outlet.
- Do not install the fan facing nearby windows. If necessary, install a noise barrier.
- Set the appliance on one of the following supports:

- concrete slabs,
- crane beam,
- concrete blocks.

- Do not expose the heat pump to corrosive or dusty atmospheres (near to dirt roads, for example).
- Do not place near to stale air extraction fans.
- Provide passages for electrical cables (very low and low voltage).

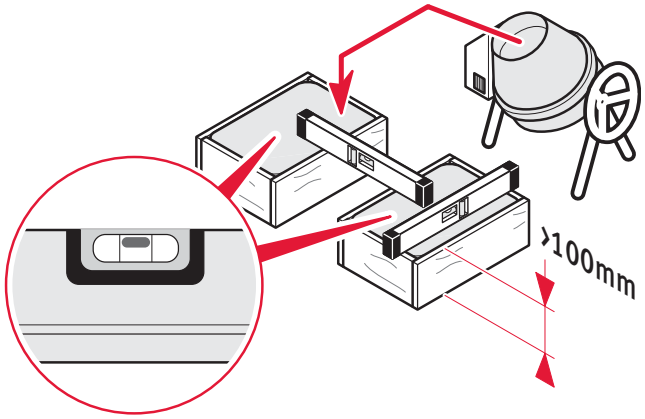
4.1.3.1 Properties of the mounting surface

- Before choosing the position of the device, carefully read the warnings relating to safety and the instructions in the installation and user manuals.
- Place the appliance on a beam or concrete blocks or on the wall supports sold separately.
- Ensure that the appliance is protected from water and from snow.

4.1.3.2 Condensate drain

Danger!
Risk of injury due to freezing of condensates.
Condensates freezing in a passageway can cause slips.
- Ensure that the drain system presents no risk of condensates freezing on a passageway.

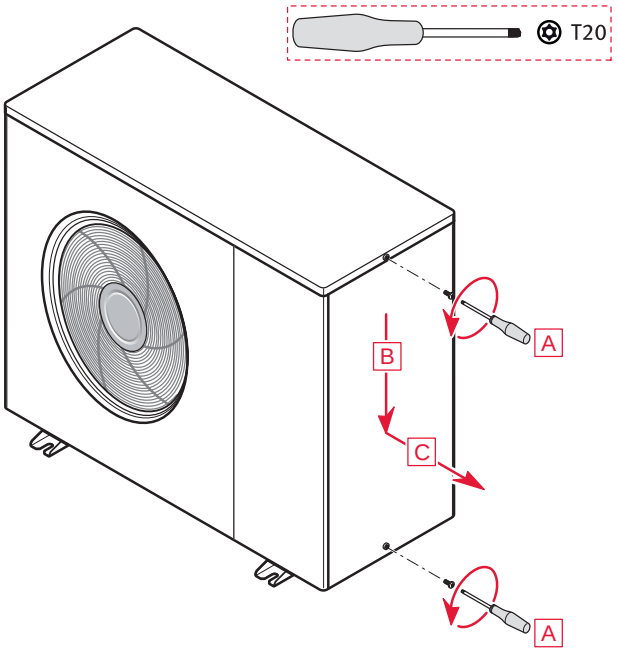
The condensates flow from the central drain located in the bottom of the heat pump.



- Provide a condensate drain either into a bed of pebbles or connected to a drain with installation of a siphon.

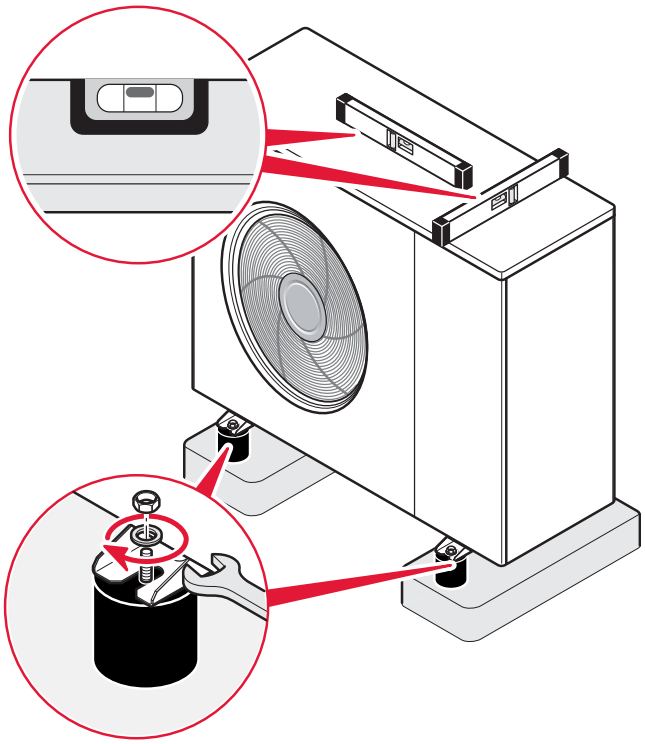
4.2 Mounting the appliance

4.2.1 Opening the appliance



4.2.2 Positioning the appliance

The heat pump must be installed with the anti-vibration pads supplied. The anti-vibration pads are used to raise the unit, limit the transmission of vibrations and to facilitate the discharge of condensates.



- Install the appliance level so that the condensates drain correctly.

4.3 Hydraulic installation

Caution!
Risk of damage caused by contaminated lines!
Foreign bodies such as welding remnants, sealing residue or dirt in the supply lines can cause damage to the product.
- Flush the supply lines thoroughly before installation.

Caution!
Risk of damage due to corrosion.
If plastic pipes that pass oxygen are used in the heating installation, this may corrode or sludge up the appliance's heating circuit or the appliance itself.
- If you use plastic pipes that pass oxygen in the heating installation, add a corrosion inhibitor to the circuit water.

4.3.1 Hydraulic connection

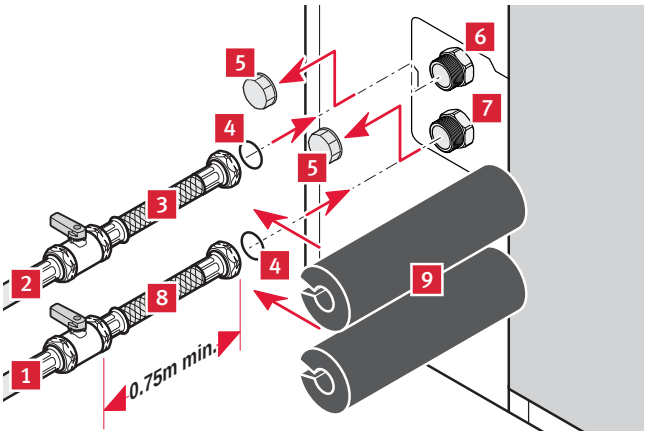
Insulate the pipes (between the heat pump and the installation including those underground) with an UV- and high-temperature-resistant insulation.

In order to avoid the transmission of vibrations to surrounding structures, flexible hoses of at least 750mm in length should be used for the hydraulic connections from the heatpump.

- Do not weld pipes mounted up : this operation may damage the seals.
- If the heat pump is not located at the highest point of the hydraulic circuit, install additional bleed valves in suitable places.
- Install the following components on the heat pump return circuit.

Installation with hydraulic module	Installation without hydraulic module
- a drain tap - an air separator (if necessary) - an anti-sludge filter - an expansion tank, if the length of the hydraulic circuit is greater than the max. permitted length (see table below) - a 3 bar (3 x 10^5 Pa) safety valve if the hydraulic module does not have one	- a drain tap - an air separator (if necessary) - an anti-sludge filter - an expansion tank suitable for the complete hydraulic installation - a 3 bar (3 x 10^5 Pa) safety valve - a pressure gauge (recommended)

Max. length of the hydraulic circuit	DN 28
In the case of the installation of a module without an expansion tank	30 m



Key
1 Return circuit ¼ turn shut-off valve in the direction of the heat pump (not included) (*)
2 Heat pump flow circuit ¼ turn shut-off valve in the direction of the building (not included) (*)
3 Flow heat pump circuit hose in the direction of the building (not supplied)
4 O ring
5 Cap
6 Flow heat pump connection (Ø 1¼") to the building
7 Return connection (Ø 1¼") to the heat pump
8 Return circuit hose in the direction of the heat pump (not supplied)
9 Insulation (not supplied)
(*) Available as an accessory

- Remove the protection caps (4) located on the connections.
- Install the filter on the heat pump return pipe. Install it between 2 shut-off valves in order to be able to remove if from the circuit and clean it periodically.
- Connect a flexible pipe + the O ring and a shutoff valve to the heat pump outlet and return connectors.
- Check that there are no leaks. Repair if necessary.

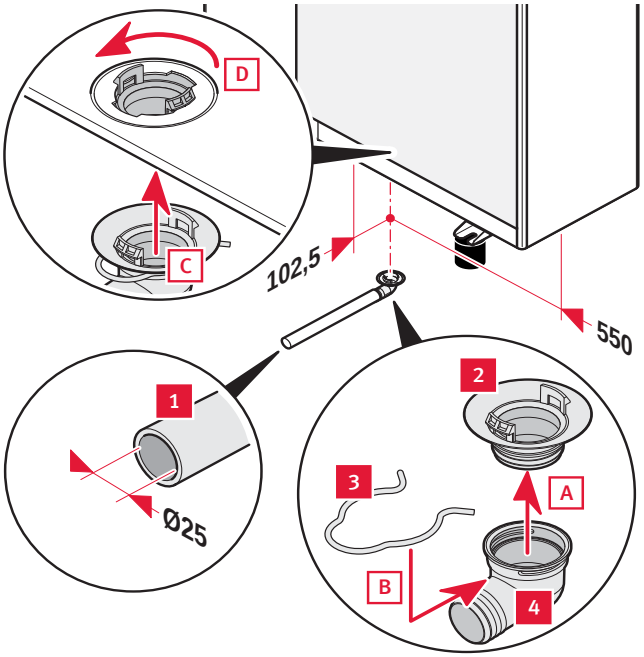
4.3.2 Swimming pool option

Caution!
Risk of damage in the case of a direct connection to the swimming pool.
If the heat pump is connected directly to the swimming pool, the appliance may be damaged by corrosion.
- Do not connect the heat pump hydraulic circuit directly to a swimming pool
- Use a swimming pool kit with an external heat exchanger.

- In the case of an installation with a swimming pool option, take into account the water volume up to the swimming pool kit for proper sizing of the installation (e.g.: expansion tanks...).

4.3.3 Condensate discharge

Observe these instructions, the legal directives and the local regulations to evacuate condensates.

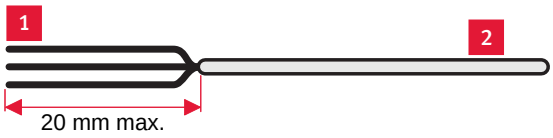


Key
1 Condensate drain pipe
2 Adapter
3 Clip
4 Elbow

- Assemble the elbow and the adapter (A) and then secure it with the clip (B).
- Install the condensate evacuation pipe onto the elbow.
- Insert the heat pump electric heater into the pipe to prevent condensates freezing in the pipe.
- Insert the adapter into the hole in the base of the heat pump (C), then turn the adapter a ¼ turn to lock it into position (D).
- Connect the pipe to the condensate evacuation circuit either in a bed of pebbles or connected to a drain using a siphon.
- Make sure that the condensate does not stagnate in the drain hose.
- Make sure that the drain hose is not connected tightly to the waste water piping.

4.4 Electrical Installation

Danger!
Risk of electric shock due to an improper electrical connection!
Improper electrical connection can cause electric shock or might negatively affect the operational safety of the product and might cause material damage.
- The electrical connection of the product must be carried out only by a suitably qualified person.



Key
1 Electrical wires
2 Insulation

When you connect the electrical wires to a connector on the electronic board:

- Keep a distance of a maximum of 20 mm between connector and the start of the insulation.
- Fix the electrical cables with the clamps installed inside the heat pump.

4.4.1 Connecting the power input (mains connection)

The external wiring must be earthed, with correct polarity and in accordance with current standards.

- Always check that the Live and Neutral are connected correctly.

The cables connecting the switchboard and the heat pump must be:
- Suitable for a fixed installation.
- weather resistant.
- equipped with wires adapted to appliance's power rating.

- Connect the heat pump to an electrical panel via an independent protection system (differential breaker with at least 3 mm between each contact).

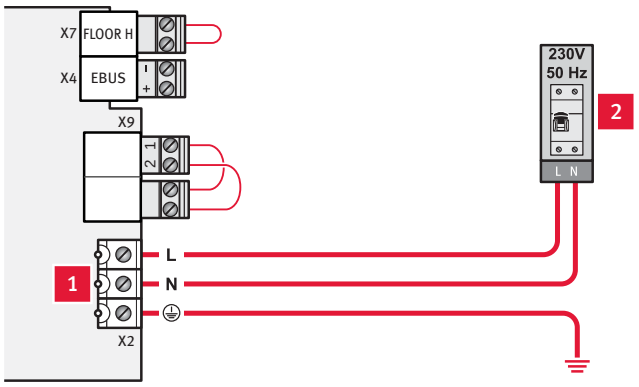
Additional protection may be required during installation to ensure surge category II.

The power supply cut-off devices must allow complete disconnection of the power under the conditions required for over-voltage category III.

4.4.1.1 230V heat pump

Caution!
Risk of damage from too great voltage.
At mains voltages higher than 253 V, electronic components may be destroyed.
- Make sure that the rated voltage of the mains is 230 V.

Caution!
Risk of malfunction due to the electrical supply.
If the imbalance between the phases of the electrical supply is too large, a malfunction may occur.
- Install the appliance on a electrical supply with a maximum imbalance of 2% between phases.

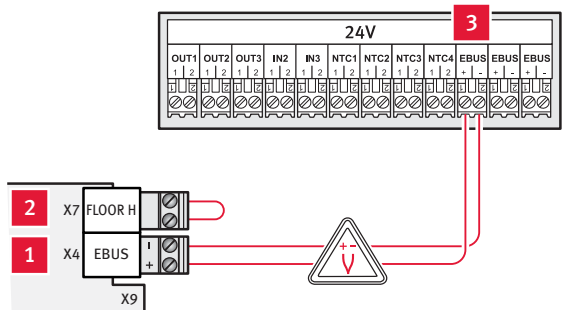


Key
1 Heat pump power supply connection
2 Installation power supply and electric protection

	Envirosorb3 8	Envirosorb3 11
Electricity supply	1/N/PE 230V 50Hz	1/N/PE 230V 50Hz
Circuit breaker	16 A - Type C or D	20 A - Type C or D
Recommended cable size 230V	3G x 2.5 mm²	3G x 2.5 mm²

- Connect a cable to the appliance's power terminal.
- Pass the cables through the heat pump cable gland (see section 4.4.3).
- Suitable breaker size and type must be used to fit installation site requirements.
- Cable size must be suitable for installation site requirements

4.4.2 24V cable connection



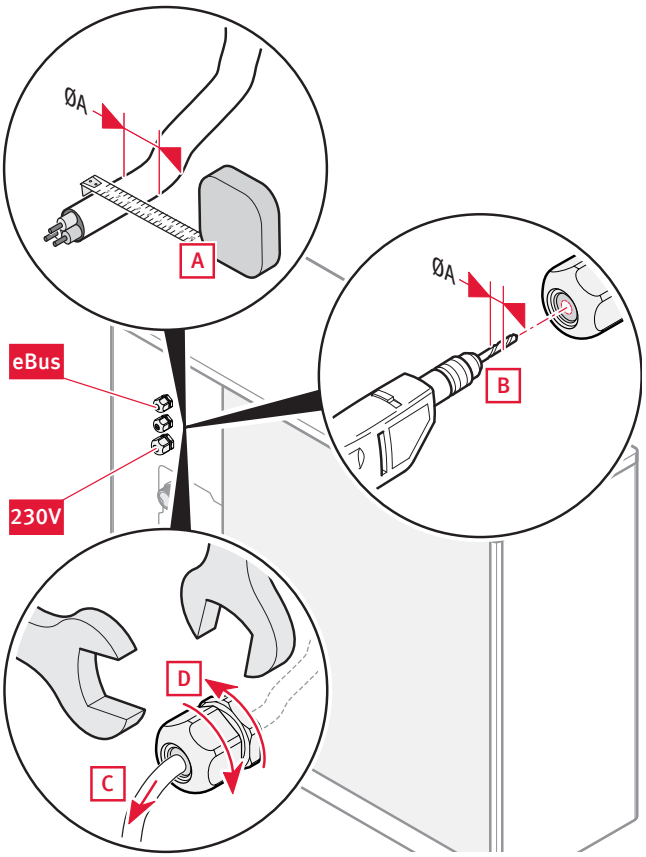
Key
1 eBUS connection to the heat pump (comply with the polarity ±)
2 Connect the floor heating protection device to the heat pump
3 e-BUS connection terminal on the control box

	Envirosorb3 8	Envirosorb3 11
Recommended cable size eBus	2 x 0.75 mm²	2 x 0.75 mm²
Recommended cable size eBUS + FLOOR H	4 x 0.75 mm²	4 x 0.75 mm²

- Pass the cables through the heat pump cable gland (see section 4.4.3).
- Connect the e-BUS cable to the system control box complying with the polarity ±.
- If a manual reset floor heating protection device (55°C) is installed on the heating circuit outlet, remove the link from the terminal (2) and then connect the floor heating protection device to this terminal.

4.4.3 Cable routing

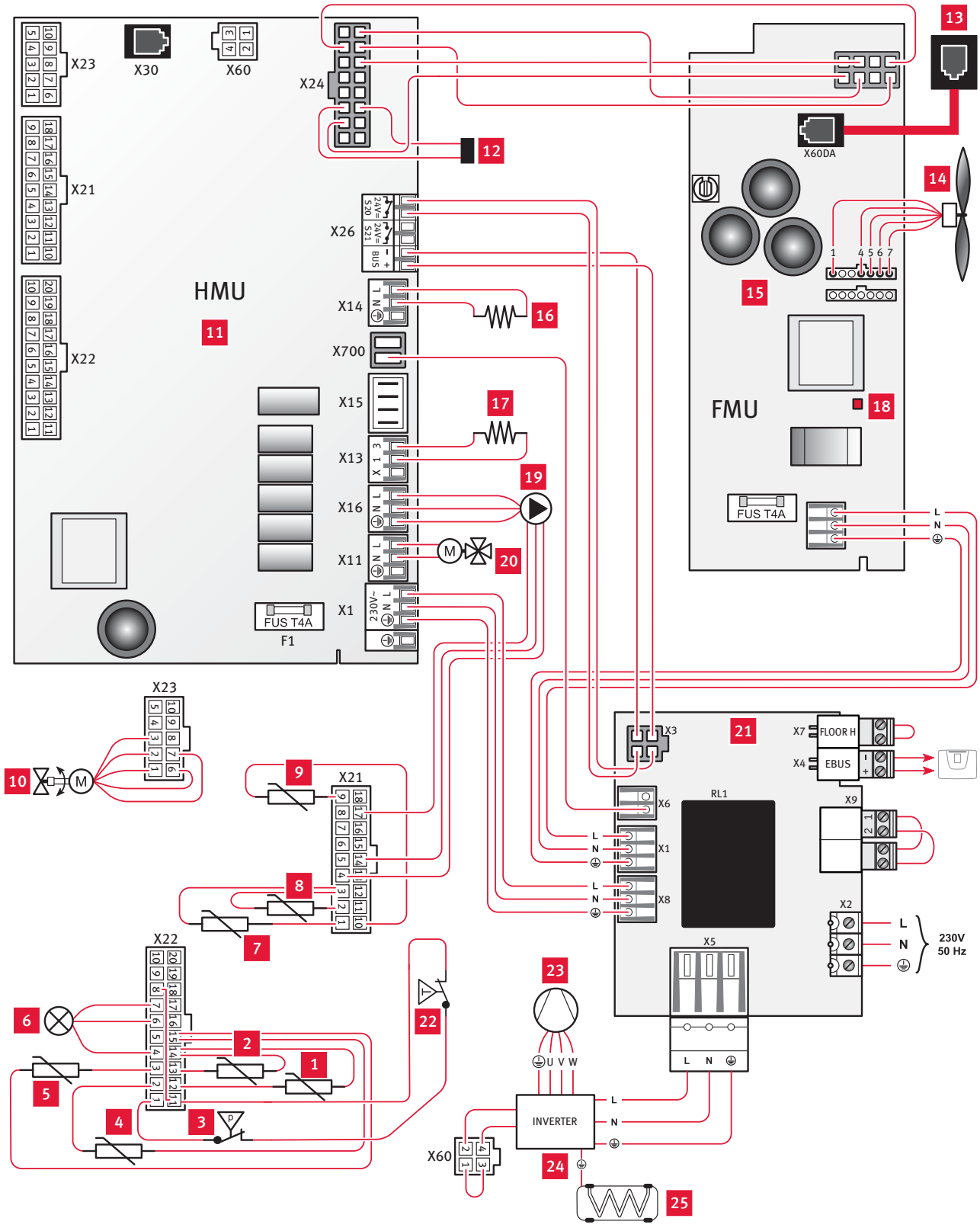
Caution!
Risk of appliance malfunction
If the very low voltage and low voltage cables are in the same duct, the very low voltage signal will be disturbed by the low voltage.
- Run the very low voltage and low voltage cables in different ducts.



Key
eBUS e-BUS cable and floor heating protection device cable gland
230V 230V supply cable gland

- Measure the diameter of the cable (A).
- Use a drill of the same diameter as the cable and drill through the cable gland seal (B).
- Pass the cable through the cable gland provided for this purpose (C)
- Set the cable gland with 2 flat spanners (D) to get it tight.

4.4.4 Circuit diagram (230V heat pump)



Key

1 Fin exchanger temperature
2 Temperature sensor after plate to plate heat exchanger
3 Refrigerant circuit high pressure sensor
4 Compressor suction temperature sensor
5 Compressor discharge temperature sensor
6 Refrigerant pressure switch
7 Heat pump flow temperature sensor
8 Heat pump return temperature sensor
9 Air outside temperature sensor
10 Electronic expansion valve
11 Main PCB
12 Product coding resistor
13 Diagnostic tool connector
14 Fan
15 Fan management card
16 Compressor crankcase heater
17 Condensate drain electric heater
18 Steady red LED (appliance on)
19 Modulating high performance pump including a water flow rate sensor
20 4 way valve
21 Installer interface
22 Overheating safety
23 Rotary compressor
24 Inverter box
25 Fin exchanger

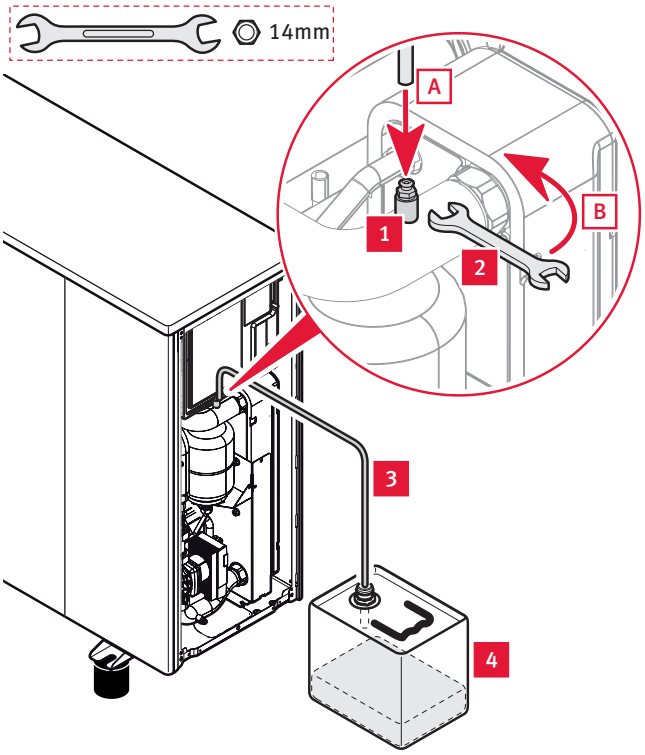
5 Start-up

- Refer to the operating instructions before starting the product.
- Check that the differential breaker is installed.
- Check that the hydraulic and electrical connections are correct.
- Check that the filter on the heat pump return is installed.
- Check the airtightness of the connections.
- Open all the hydraulic circuits' valves.

5.1 Filling the hydraulic circuit

We recommend that you use propylene enriched with corrosive inhibitors.

- Do not dispose of glycol into drains and the environment.
- Mix a maximum of 50% of propylene or ethylene glycol with water. The mixture must provide anti-freezing protection for the heat pump hydraulic circuit.
- Use an antifreeze test kit to ensure accurate dosing.



Key
1 Air trap
2 Flat wrench (*)
3 Hose
4 Deposit (*)
(*) Not included

- Connect one end of the hose to the tap (A).
- Insert the other end of the hose (3) into the container during the venting of the circuit.
- Using a flat wrench, open the tap a ¼ turn (B) in order to remove the air present in the glycol circuit, then close it quickly (in order to avoid emptying the circuit).
- In order to bleed the hydraulic circuit of the heat pump during the filling, use a filling pump.
- Put the heat pump circuit under pressure between 1.5 and 2 bars.

The hydraulic circuit pressure may decrease during the first month following the commissioning of the installation. It may also vary in accordance with the outdoor temperature.

5.2 Activating the heat pump

- Ensure that the setting of the maximum temperature of heating flow is compatible with the installation.
- Refer to the system installation manual in order to fully activate the installation.
- Switch ON the circuit breaker which is located on the electrical panel and connected to the heat pump.

5.3 Checking the operation of the device

- Ensure that the external regulators (thermostat, external sensor, ...) send a request to the heat pump. In the case of a multi-zone configuration, perform the test zone by zone and ensure that the appropriate zone gets warmer.
- Ensure that all the heating circuit's thermostatic valves are open.
- Balance the heat emitters, if necessary.

5.4 Adjustment of HP circuit flow

5.4.1 Bleeding the hydraulic circuit

If the swimming pool option is installed on the circuit put the kit's 3 way valve on AUTO position.

- Connect one end of the hose to the tap.
- Insert the other end of the hose into the container in order to recover any residual glycol during the venting of the circuit.
- Close the shutoff valves at the rear of the heat pump.
- Pressurise the hydraulic circuit.
- Using a flat spanner, open the bleed valve.
- Open the lower shutoff valve at the rear of the heat pump.
- When liquid comes out of the pipe, close the bleed valve
- Check that the hydraulic circuit pressure is between 1.5 and 2 bar. Otherwise, top up the hydraulic circuit.
- Completely open the two shutoff valves at the rear of the heat pump.
- Remove the hose and the container.

5.4.2 Adjusting the hydraulic circuit flow rate

The heat pump is designed to operate above a minimum flow rate. If the heat pump functions at a minimum flow rate, this will result in a loss of power and performance. The heating comfort will still be guaranteed but the energy savings will be reduced.

	Envirosorb3 8	Envirosorb3 11
Minimum flow	380 l/h	540 l/h
Recommended flow	1400 l/h	1900 l/h

It is possible to read the flow rate directly on the controller. Depending on the type of fluid used in the hydraulic circuit, the flow rate displayed on the control box may be over-estimated.

Example: If you use a 30% propylene glycol mixture and the fluid temperature is 5°C, you must subtract 400l/h from the value displayed on the control box.

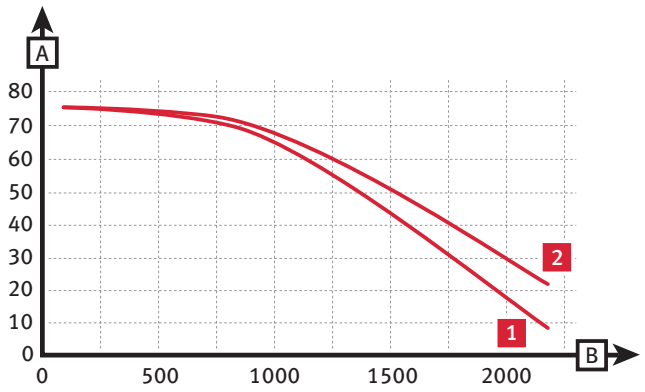
- Refer to the table below for the various values of over-estimation of the flow rate depending on the fluid type and temperature.

Flow rate over-estimation (l/h)		Fluid temperature		
		5°C	15°C	25°C
Fluid type	Water	0	0	0
	Propylene glycol 30%	400	240	120
	Propylene glycol 50%	650	500	400

Incorrect venting of the installation may lead to flow variations.

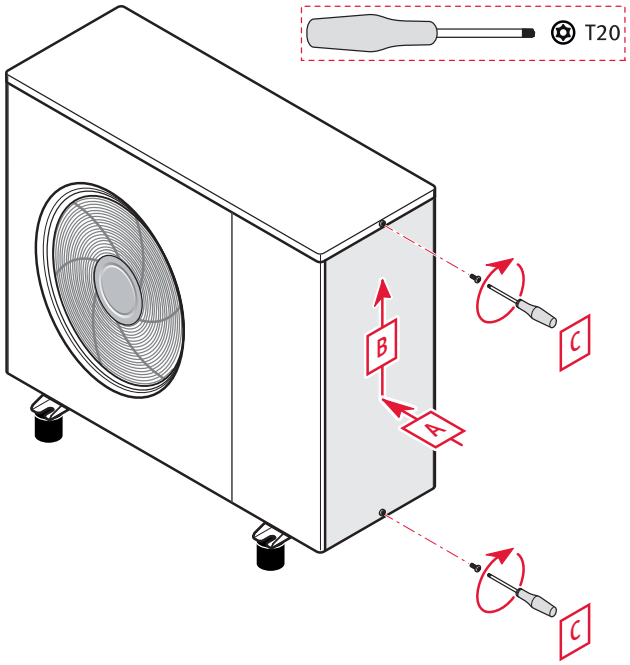
- If you cannot reach the minimum flow rate, install an auxiliary pump.
- Refer to the system documentation for the information necessary for installing the auxiliary pump.
- If you cannot achieve the recommended flow rate, adjust the circuit pressure on the control box and, if necessary, use the flow rate adjusting tap on the hydraulic module.

5.4.2.1 Available pressure in hydraulic circuit of the heat pump



Key
1 Envirosorb3 8 (with the water circuit at 20 ° C)
2 Envirosorb3 11 (with the water circuit at 20 ° C
A Available pressure (kPa)
B circuit flow rate (l/h)

5.5 Installation of side panel



5.6 User information

After completing the installation:

- Explain to the user the system operation.
- Draw special attention to the safety instructions that the user must follow.
- Inform the user of the necessity to ensure that the system is regularly maintained (maintenance contract).
- Explain to the user how to check the water level/filling pressure of the system.
- Answer any questions the user may have.

6 Maintenance

Danger!
Risk of injury due to unintended intervention on the refrigerant circuit!
The device contains refrigerant fluid and must be handled with care. Any work carried out on the refrigerant circuit must be conducted by qualified engineers.

- Only work on the refrigerant and cooling circuit if you are a trained and approved specialist equipped with appropriate protective equipment.
- Perform draining and filling operations in a properly ventilated area.
- Avoid any contact with the skin or eyes.

6.1 Observe maintenance intervals

- Maintain the product only if you are a competent person.
- Carry out annual maintenance.

6.2 Preparing maintenance

6.2.1 Providing spare parts for maintenance and repair work

- In case you need spare parts during maintenance or repair, exclusively use genuine Glow Worm spare parts.

The genuine component parts of the product have been certified together with the product in the course of the CE conformity check. If you do NOT use certified genuine Glow Worm spare parts during maintenance or repair, the CE conformity of the product will expire. That is why we imperatively recommend to install genuine Glow Worm spare parts.

6.3 Pre-maintenance instructions

Comply with the basic safety rules before performing maintenance or installing spare parts.

- Shut down the system.
- Switch off the system electrical supply.
- Isolate the hydraulic circuit from the appliance using the shut-off valves where necessary.
- Drain the appliance if you need to replace hydraulic circuit components.
- Protect all electric components from water if you have to work on the appliance.

6.4 Annual Maintenance

- Check the proper functioning of safety devices.
- Check the pressure of the water system.
- Check tightness of refrigerant circuit.
- Check that there are no traces of rust or oil around the refrigerant circuit's components.
- Ensure that the appliance's components are neither worn nor broken.
- Check that the wires are firmly attached to the electrical terminals.
- Check the appliance's grounding.
- Check the flow temperature of the heat pump and the setting points.
- Check that the fan rotates freely.
- Check the pressure of the expansion vessel.

6.5 Cleaning

6.5.1 External cleaning

- If the appliance needs cleaning, refer to the user manual.

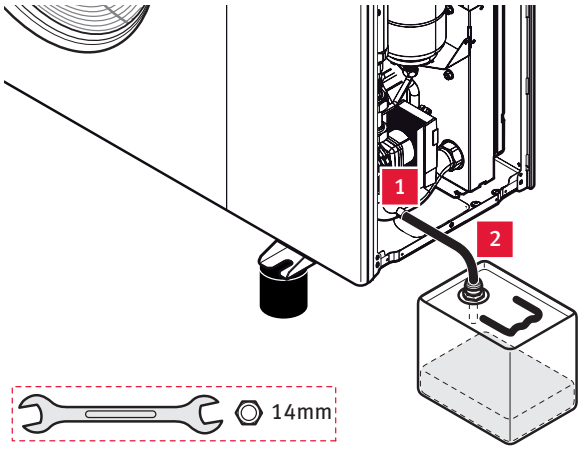
6.5.2 Cleaning the components

- Check the absence of ice on the compressor.
- Remove any dust from electronic boxes.
- Clean the air / refrigerant battery and make sure that air circulates between the fins and around the unit.
- Check that condensates can properly drain from the heat pump by removing the adapter located under the heat pump (turn it a ¼ turn to unlock).
- Clean the evaporator on both sides using a brush with soft bristles. Remove the fan blades and the rear grill before cleaning.

Warning!
Risk of minor injury.
Handling the fan blades and grill can cause cuts.
- Wear protective gloves to perform this operation.

6.6 Draining

- Cut off the appliance's electricity supply.



Key
1 Hydraulic circuit venting valve
2 Draining hose

- Close the shut-off valves located behind the heat pump.
- Engage a hose (2) to the venting valve (1) or place a container under the venting valve (1) to drain the hydraulic circuit.
- Open the bleed valve (1) with a flat spanner.

Note: if necessary, the heating installation can be drained via this bleed valve by opening the shutoff valves located at the rear of the heat pump.

6.7 Checking the appliance status codes

The status codes can be checked at any time to know what operating phase the appliance is in. These codes can be read on the system control box screen.

The status codes are described in a table in the appendix (see section 11.1).

6.8 Checking the electrical installation

- Check the electrical installation observing all relevant regulations

6.8.1 Checking the cables

If the power cable of this product is damaged, then to prevent danger, only the manufacturer, the after-sales service or similarly qualified persons shall replace the power cable.

- When replacing the power cable see chapter 4.4.

6.9 Start-up after maintenance

- Once the maintenance operations have been completed, start-up the product (see chapter 5).
- After having completed work, check for the tightness of hydraulic components.
- When work on the product is completed, perform an operational test and check system safety.

7 Trouble-shooting

7.1 Fault diagnosis

The following checks should be performed before proceeding onto specific diagnostics:

- Make sure that the electricity supply has not been interrupted and that the appliance is connected correctly.
- Ensure that the isolating valves are open.
- Check that all external controls are connected correctly.

7.2 Error codes

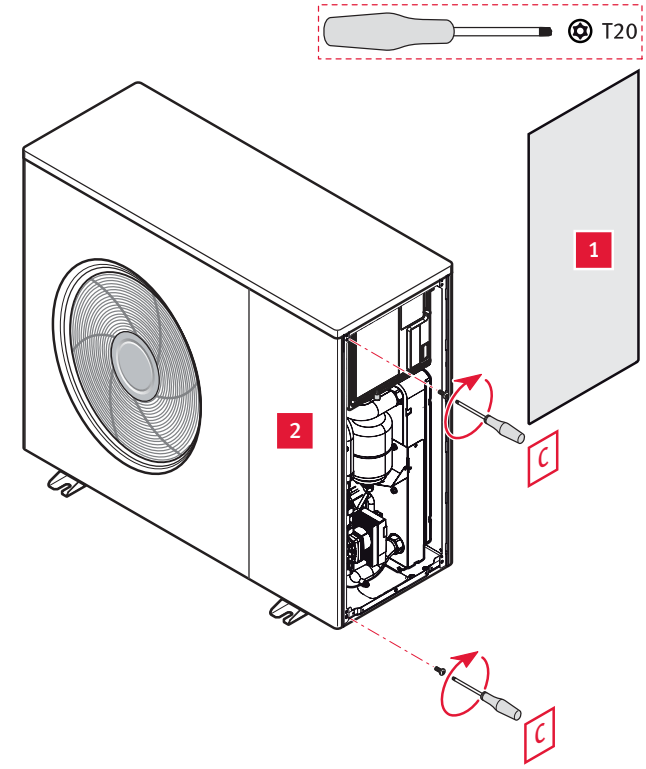
The error codes are described in a table in the appendix (see section 11.2).

In the case of a fault, the fault code number is displayed on the control unit.

- Carry out any necessary repairs.
- Switch ON/OFF the appliance using heat pump circuit breaker.

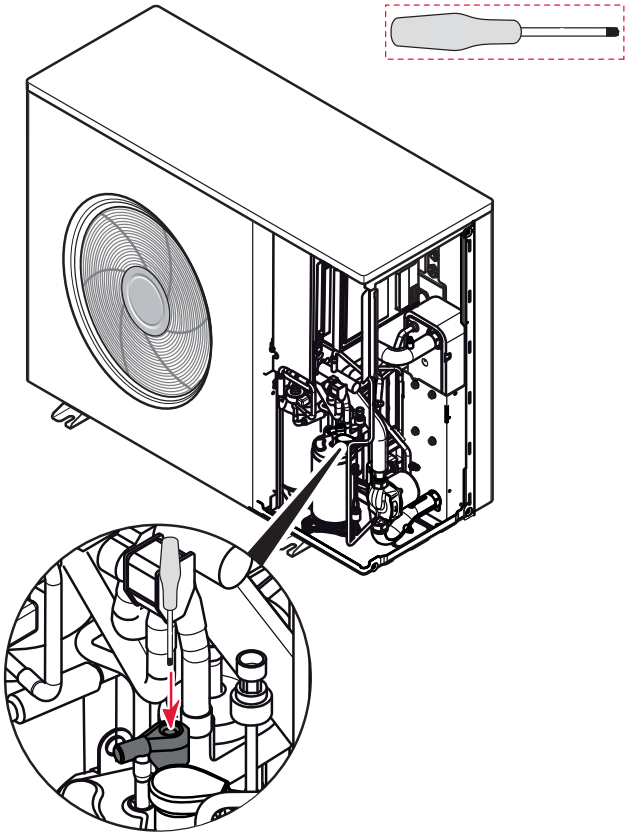
7.3 Resetting the overheating safety

In the case of overheating, the heat pump shuts down. Once the temperature has returned to normal, you must reset the overheating thermostat to restart the heat pump.



- Remove the side panels (1 and 2).
  (Refer to section 5.5)

Danger!
Danger of death by electrocution
Resetting the heat pump can present a risk of electrocution.
- Do not open the electrical box during the resetting procedure.



Resetting the heat pump is only possible if the temperature has dropped below 110°C.

- Push the screwdriver into the overheating safety(1) until a “Click” is heard.

8 Decommissioning

- Switch off the product.
- Isolate the product from the power mains.
- Drain the appliance (see chapter 6.5).
- Recycle or dispose the product and its components (see chapter 9).

9 Recycling

9.1 Packaging

- Sort the waste to separate those which can be recycled (cartons, plastics...) from those that cannot (strapping ...).
- Recycle the product packaging according to all relevant regulations.

9.2 Appliance

- Do not dispose of your product or any of its accessories in the household waste.
- Make sure the old unit and any accessories are disposed of properly.
- Observe all relevant regulations.

9.3 Refrigerant fluid

Attention!
Risk of pollution!
This appliance contains R410-A refrigerant fluid which must never be released to the atmosphere. R410-A is a fluoride greenhouse gas covered by the Kyoto protocol.

- Before discarding the appliance, correctly recover the refrigerant fluid into an appropriate container to be recycled in compliance with the regulations in force.

The recycling of the refrigerant fluid must be performed by the qualified professional who installed the device.

The personnel approved for this recuperation must have an appropriate certification according to the regulations in force.

10 Technical data

This technical data is valid for a new appliance with its own heat exchangers.

Description	Unit	Envirosorb3 8	Envirosorb3 11-1ph
Min. operating air temperature (heating and tank heating)	°C	-20	-20
Max. operating air temperature (heating)	°C	35	35
Max. operating air temperature (domestic hot water)	°C	46	46
Specifications, with radiators			
(start : 45°C, return : 40°C, dry temperature (wet) 7 (6)°C)			
Heating output	kW	7,20	10,20
COP* A7(6) W45-40		3,5	3,35
(start : 55°C, return: 47°C, dry temperature (wet) : 7 (6)°C)			
Heating output	kW	6,60	9,40
COP* A7(6) W55-47		2,70	2.60
Specifications, with underfloor heating			
(start : 35°C, return : 30°C, dry temperature (wet) : 7 (6)°C)			
Heating output	kW	7,60	10,60
COP* A7(6) W35-30		4,50	**4,30**
(start : 35°C, return : 30°C, dry temperature (wet) 2 (1)°C)			
Heating output	kW	5,60	8,40
COP* A2(1) W35-30		3,40	3,10
Refrigerant circuit			
Type of refrigerant		R-410A	
Quantity of refrigerant	kg	1.950	3.530
Type of compressor		Rotary	
Type of oil		specific Polyvinylether (PVE) oil.	
Type of regulator		Electronic	
Maximum relative operating pressure (PS)	bar	41.5	41.5
	Pa	41.5×10^5	41.5×10^5
Heat pump circuit			
Min. filling pressure.	bar	1	1
	Pa	1×10^5	1×10^5

Description	Unit	Envirosorb3 8	Envirosorb3 11-1ph
Max. filling pressure.	bar	3	3
	Pa	3 x 10^5	3 x 10^5
Minimum water flow rate	l/h	380	540
Maximum water flow rate	l/h	1400	1900
Expansion vesel capacity	l	2	2
Capacity of the hydraulic circuit internal to the heat pump	l	4	4
Minimum capacity of the complete hydraulic circuit	l	21	35
Plate heat exchanger material		AISI 304	
Electrical			
Supply voltage/frequency	V/Hz	1/N/PE 230V 50Hz	
Electronic card fuses FMU and HMU		T4A / 250V	
Inverter controller fuse		HRC 20A 550V	HRC 32A 550V
Maximum absorbed current (I max)	A	16A	20A
Starting current	A	‹ 16A	‹ 20A
Index of electrical protection		IP25	IP25
Electrical classification		I	I
Surge category		II	II
Pollution rating		2	2
Fan electrical consumption	W	45	80
Pump electrical consumption	W	70	70
Nominal input current at A7W35	A	8,27	12,3

Description	Unit	Envirosorb3 8	Envirosorb3 11-1ph
Dimensions			
Height	mm	939	939
Width	mm	1103	1103
Depth	mm	415	415
Heat pump Ø Water circuit connections	"	1 ¼	1 ¼
Nett total weight	kg	105	129
Sound power level : overall exterior noise (according to EN 12102 and EN ISO 9614-1) under nominal A7W45 conditions.	dBA	60	65
Fan rotation speed	tr/ min^{-1}	550	675

* Coefficient Of Performance (according to EN 14511)
** Energy Efficiency Ratio (according to EN 14511)

Fluorinated greenhouse gases as identified in the Kyoto protocol, are contained within a fully sealed system.

11 Appendix

11.1 Table of Diagnosis codes

Réf. état	Description
0	Heat pump waiting
1	Pump pre-run before heating
2	Pump pre-run correct in heating mode
3	Water temperature / heating setting compatibility test
4	Heating phase start activation
5	Pre-run of pump at maximum speed in heating
6	Pre-run of fan in heating
7	Setting the 4-way valve to the heating position
8	Setting electronic expansion valve to the heating position
9	Compressor start request in heating mode
10	Heat pump in heating mode
11	Heat pump in domestic hot water heating mode
12	Water temperature exceeded in heating mode
13	Water temperature exceeded in domestic hot water heating mode
14	Pump post-run after heating
15	Pump pre-run before de-icing
16	Heat pump in de-icing mode
17	Pump post-run after de-icing
18	Pump remote controlled (top-up)
19	Compressor oil temperature too low for start-up
30	Pump pre-run before cooling
31	Pump pre-run correct in cooling
32	Water temperature / cooling setting compatibility test
33	Cooling phase start activation
34	Pre-run of pump at maximum speed
35	Fan pre-run
36	Setting 4-way valve to cooling position
37	Setting electronic expansion valve to the cooling position
38	Compressor start request in cooling mode
39	Heat pump in cooling mode
40	Water temperature exceeded in cooling mode
41	Post-run of the pump after cooling
50	Pressure balance fault
51	Pressure switch fault
52	Pressure envelop fault detected
53	Start envelop not ok error detected
54	Loss of “cheap tariff” supply block
55	Refrigerant circuit pressure out of range: HP/LP ratio too low

Réf. état	Description
56	Refrigerant circuit pressure out of range: condensation too low
57	Refrigerant circuit pressure out of range: evaporation too high
58	Refrigerant circuit pressure out of range: condensation too high
59	Refrigerant circuit pressure too low
60	Compressor outlet over-heat
61	Compressor inlet temperature sensor fault
62	Compressor outlet temperature sensor fault
63	Plate exchanger temperature sensor fault
64	Fin exchanger temperature sensor fault
65	Outside air temperature sensor fault
66	Flow water temperature sensor fault
67	Return water temperature sensor fault
68	Refrigerant circuit high pressure sensor fault
69	Low voltage fault – inverter box bus
70	Inverter box disconnected fault
71	Inverter box over-heat fault
72	Inverter box current-voltage fault
73	Under power fault – inverter box bus
74	Overvoltage power fault – inverter box bus
75	Inverter box internal fault
76	Inverter box radiator sensor fault
77	Inverter box overload fault
78	“FMU” fan circuit board fault
79	e-BUS communications fault
80	Water flow rate fault
81	Communications fault with the inverter box
82	Compressor overcurrent fault
83	Water flow temperature too high
84	Electronic expansion valve fault
85	Fan speed too low
86	Detection of potential icing in the plate exchanger
87	Water ΔT too high fault
88	Coding resistor fault
89	Heated floor overheating safety device fault
90	4-way valve fault
99	Appliance fault, refer to section 7.2 to see the corresponding error code.

11.2 Fault codes

- Read the heat pump status code number from the control box screen (see control box installation manual).
- Refer to the table in section 11.1 of this manual to see the heat pump state.

Fault codes	Description	Possible cause
37	Fan speed too low.	There is an obstacle in the heat pump’s air flow.
		The fan motor is defective or disconnected.
42	Product coding resistor error.	The product coding resistance is missing or defective.
		The resistance value is outside the authorised limits.

Fault codes	Description	Possible cause
86	The floor heating over heat contact is open.	The heated floor temperature is too high.
		The flow rate of the installation hydraulic circuit is too low.
		The heated floor circuits are closed.
103	Spare part identification error.	The circuit board or inverter driver used as a replacement part does not correspond to the product.

Fault codes	Description	Possible cause
514	The compressor inlet temperature sensor or connection is out.	The sensor is defective or is not correctly connected to the main PCB.
517	The compressor outlet temperature sensor or connection is out.	
519	The heating return temperature sensor or connection is out.	
520	The flow heating temperature sensor or connection is out.	
526	Coil sensor interrupt or short circuit.	
532	The flow on heat pump water circuit is too low or too high (see section 5.4.2).	Water pump defective.
		There is a lack of water.
		Anti-silt filter missing or clogged in the brine water circuit's backflow.
		The circuit was not properly bled.
		The pressure drop is too high in the hydraulic circuit.
536	The compressor discharge temperature is too high (depends on the compressor operating zone).	The compressor safety thermostat is tripped.
		The pressure switch or its electrical connection is defective.
		The refrigerant fluid level is low
		The sensor is defective or is not correctly connected to the main PCB.
		Pre-expansion in the liquid line (load loss)
		The electronic expansion valve is defective.
		The plate exchanger is clogged.
755	Position of 4-way valve error.	There is a mechanical or electrical problem. Force the 4-way valve from the control box. While forcing, check that the coil voltage is correct.
537	The discharge pressure on compressor is too high. *Blocking fault after 3rd trigger attempt*	There is an excess or a lack of refrigerant.
		Vacuum insufficient
		Presence of incondensables in the circuit
		The pressure switch or its electrical connection is defective.
537	The discharge pressure on compressor is too high. *Blocking fault after 3rd trigger attempt*	Pre-expansion in the liquid line (load loss)
		Poor water flow rate.
		The water flow sensor is defective.
		Insufficient heat exchange at the plate to plate exchanger.
539	The pressure of the low pressure circuit is too low.	Lack of refrigerant.
		Lack of airflow.
		There is no defrosting.
		The condensate tray resistance heater is faulty.
		The 4-way valve is defective.
		The electronic expansion valve's motor is defective or the connection is defective.
546	Cooling circuit pressure sensor fault.	The sensor is defective or not correctly connected to the main circuit board.

Fault codes	Description	Possible cause
554	Operation outside the compressor's limit.	An excess or a lack of refrigerant.
		Presence of incondensables.
		The electronic expansion valve is defective.
		Pre-expansion in the liquid line (load loss)
		Insufficient heat exchange at the plate to plate exchanger or tube exchanger.
		The 4-way valve is defective.
582	The expansion valve motor or connection is out.	The wiring harness is damaged or disconnected.
585	The subcooling temperature sensor in heating mode or connection is out.	The sensor is defective or is not correctly plugged in to the main PCB.
685	eBus communication with heat pump is out.	The appliance is not connected to the control box.
		The cable polarity is reversed.
750	Compressor disconnected.	The wiring harness is damaged or disconnected.
751	Compressor overcurrent.	Compressor fault.
		The heat pump supply voltage is too low.
		The finned heat exchanger is dirty.
		The plate heat exchanger is dirty.
752	Inverter driver error.	The inverter box is damaged.
		The inverter box radiator is blocked.
		The supply voltage is incorrect.
753	Communications error with the inverter box.	The connection between the main circuit board and the inverter box is damaged or disconnected.
		The inverter box is not powered up.
754	Fan coil board internal error (FMU).	The fan is defective.
		The connection between the main circuit board and the fan card is damaged or disconnected.
		The fan card is defective.
		The fan card power supply is defective.
774	The air inlet temperature sensor or connection is out.	The sensor is defective or not correctly connected to the main circuit board.

For further technical information please call 0844 736 1143

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GLOW-WORM

Nottingham Road,
Belper, Derbyshire.
DE56 1JT

www.glow-worm.co.uk

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